Endothelial Cell Mechanotransduction in the Dynamic Vascular Environment

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Public Summary:
The endothelial cells (ECs) that line the inner layer of blood vessels are responsible for maintaining vascular homeostasis under physiological conditions. In the presence of disease or injury, ECs can become dysfunctional and contribute to a progressive decline in vascular health. ECs are constantly exposed to a variety of dynamic mechanical stimuli, including hemodynamic shear stress, pulsatile stretch, and passive signaling cues derived from the extracellular matrix. This review describes the molecular mechanisms by which ECs perceive and interpret these mechanical signals. The translational applications of mechanosensing are then discussed in the context of endothelial-to-mesenchymal transition and engineering of vascular grafts.

Scientific Abstract: